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POLICY RESPONSES TO THE NEW OFFSHORING: THINK GLOBALLY, INVEST LOCALLY

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Working Paper 2006-01

Canada

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Abstract

This paper examines the issues surrounding outsourcing and offshoring of goods and services. In considering international offshoring, two trends stand out. The first is the rise of China as the world's manufacturer. The second is the rapid growth of traded services involving innovative, technology-intensive processes and employing high-paid white collar workers. Offshoring enables firms to concentrate on core activities and their competitiveness. Thus, the paper argues that offshoring is both a threat and an opportunity. Many Canadian firms have yet to recognize the sea change in their sourcing possibilities. Better information about the strategic offshoring option is needed. Offshoring has important policy implications for Canada and other major economies. The building blocks for globally competitive Canadian firms are domestic policies that encourage investment in upgrading and innovation by individuals (i.e. human capital) and firms (i.e. research and development and advance technologies).

Key words: service offshoring, outsourcing, low-cost countries, trade, skill, low wages

Résumé

L'auteur examine les questions relatives à l'impartition à l'étranger et à la délocalisation de biens et de services. En matière de délocalisation à l'étranger, deux grandes tendances sautent aux yeux. La première est l'importance de plus en plus grande de la Chine en tant que fabricant pour le monde entier. La deuxième est l'essor du commerce des services qui font appel à des procédés novateurs, à forte composante technologique, et à des travailleurs cols blancs hautement rémunérés. La délocalisation permet aux entreprises de se concentrer sur leurs principales activités et leur compétitivité. Selon l'auteur, la délocalisation est à la fois menace et occasion. Bon nombre d'entreprises canadiennes n'ont pas encore pris conscience de toutes les possibilités qui s'offrent à elles en matière d'approvisionnement. Il faut disposer de meilleurs renseignements sur l'option stratégique de la délocalisation. Celle-ci a une incidence importante au chapitre des politiques sur le Canada et d'autres grandes économies. Des politiques nationales qui favorisent l'investissement dans le perfectionnement et l'innovation chez les individus (p. ex. le capital humain) et au sein des entreprises (p. ex. la recherche et développement et les technologies de pointe) sont la pierre angulaire de la compétitivité mondiale des entreprises canadiennes.

Mots clés : délocalisation de services, impartition, pays à faible coût, commerce, main-d'oeuvre spécialisée, faibles salaires

When asked to provide a framework piece on offshoring, I decided it would be much easier to have the work done by an Indian consulting firm. A quick bit of research turned up a perfect partner in Infiniti Research. Not surprisingly, the company has a London-based front end – it is a fact of the industry that many customers prefer to work through a Western intermediary. From their brochure, Infiniti quotes the job at $63,000, no GST. That's about ten times less than a Canadian management consulting firm would charge, but still too rich for my academic salary. So you are stuck with me.

The experience taught me two things. First, you can outsource just about anything, from which I conclude that all of our jobs are threatened. Second, the big money in outsourcing goes to the business analysts who help OECD customers communicate their needs to business process outsourcers in low-cost countries. I conclude from this that offshoring brings remarkable opportunities to us all. Therein lies the paradox of offshoring: it is both a threat and an opportunity.

In considering international offshoring, two trends scream out for our attention. The first is the rise of China as the world's manufacturer. Surprisingly, many Canadian firms have yet to wake up to this sea change in their sourcing possibilities. Better information about the strategic offshoring options available to Canadian firms is desperately needed. Aside from this, the rise of China's manufacturing sector poses no new public policy issues. All the familiar arguments hold. On the one hand, international trade is disruptive for workers and firms engaged in import-competing industries. On the other hand, international trade provides the benefits of lower prices to consumers and offers new opportunities for producers (both workers and firms) to expand into foreign markets. In aggregate, the benefits outweigh the costs. What remains for Canadian policy makers is to ensure that we generously care for our most disadvantaged since these unskilled workers are the ones who will bear the brunt of the Chinese offshoring onslaught.

The second extraordinary development in international trade has been the rapid growth of traded services involving innovative, technology-intensive processes and employing high-paid white collar workers. In the past it was unheard of for low-cost countries such as India to be exporting high value-added services. Now it is common to find Indian software programmers customizing sophisticated software applications for businesses worldwide. This development fundamentally alters the way we must think about innovation-based corporate strategy and public policies that affect the flexibility of the white collar labour market.

Canada faces a choice. It can insulate itself from the global competitive pressures that come with offshoring to low-cost countries. Such policies will protect firms and workers in the short run. However, just as the high tariffs that insulated Canada before 1989 retarded Canadian productivity growth, so too will future attempts to insulate Canada from the adverse effects of offshoring. In addition, insulating policies will likely encourage foreign

countries to deny us market access. Considering that Canada is a major supplier of traded services to the rest of the world, insular policies are about as useful as a blow-drier in an igloo.

Alternatively, Canada can pursue domestic framework policies that promote the competitiveness of Canadian firms and workers. These framework policies would encourage productivity-enhancing investments both by individuals (e.g., in human capital) and by firms (e.g., in R&D and advanced technologies). The building blocks for globally competitive Canadian firms are domestic policies that encourage continual investments in upgrading and innovation by individuals and firms. When it comes to the Canadian public policy response to offshoring my best advice is: think globally, invest locally.

1. Executive Summary

A. *What is New About Offshoring?*

The recent spectacular increase in trade volumes poses large challenges to businesses and workers who must adjust to a new level of global competition. This by itself does not call for a complete rethinking of Canada's trade policy. What does pose new policy dilemmas is the rise of service offshoring. Service offshoring is the use of workers located abroad to provide sophisticated services to local customers. Two dilemmas stand out.

1. Service offshoring makes use of some of the most dynamic information and communication technologies (ICT). It thus has implications for the corporate innovation strategies that lie at the heart of Canada's current competitiveness policies. Will Canadian firms be crowded out of the most innovative lines of business? There is already some evidence of this. While Canada accounted for 11% of the new call centres set up worldwide in 2002-2003, Canada only accounted for 2% of the high value-added information technology centres set up over the same period.

2. Service offshoring employs highly skilled, white collar workers operating in low-cost countries such as India. This may be displacing good Canadian jobs and depressing salaries of high-paid workers, both of which would reduce the incentives of Canadians to invest in their own human capital. In addition, the disruption caused by the growth of service offshoring may make it less worthwhile for firms to make long-term investments in their best workers. Unfortunately, the obvious policies that encourage human capital investments are likely to create Euro-sclerotic inflexibilities in Canada's high-end labour market. New approaches are need.

B. *How Big is Service Offshoring?*

Data on service offshoring is lacking. Best estimates are that in 2004 Canada exported $32 billion in offshored services and imported $36 billion. This is a small fraction of total trade. However, value added in service offshoring is far higher than in exports. I make a value-added correction to Canada's trade flows which shows that service offshoring accounts for a robust 17% of all trade in goods and service. Further, over the 1997-2004 period, service offshoring grew at an annual compound rate of 7%, much higher than the 5% growth for trade in goods. At these rates, service offshoring will double in size within a decade and account for 21% of our trade.

Our service offshoring – both inward and outward – is dominated by offshoring with the United States. Further, 85% of our service offshoring is with OECD countries. Hence, the concern about the current impacts of competition from low-cost countries is misplaced. However, our imports of offshored services from India and Hong Kong are rising at a compound annual rate of about 20%. This means that service offshoring to low-cost countries will become a substantial issue in the near future.

C. *The 64,000 job question: Wither China and India?*

Service offshoring is currently small. As it grows it will undoubtedly have important effects on Canada. However, the real concern is that in the longer run of 10-20 years, Chinese and Indian exports will devastate Canada. This concern is misplaced for two reasons. First, it ignores the ironclad law of comparative advantage which states that no country can export all goods. Even Japan, whose wages in 1959 were 12% of Canadian levels, has yet to devastate Canada and never will.

Unfortunately, the ironclad law of comparative advantage does not rule out the possibility that China and India will export high-tech goods and services to us, leaving Canadians to mend the socks of Chinese business executives. This raises a second point. Current thinking about innovation-based long-term growth emphasizes the crucial role of (1) institutions that protect property rights from preying politicians and bureaucrats, (2) institutions that provide a fully functioning legal framework for arm's length transactions, and (3) institutions that balance the needs of innovators inside the corporation against the needs of investors outside the corporation. These institutions are only beginning to take shape in China and India. It is unlikely that these institutions will evolve quickly, even over a quarter-century horizon. As a result, China and India are a long way from being the world's innovation giants.

D. *Costs and Benefits To Date*

As of 2005, the benefits of offshoring have likely outweighed the costs. For one, service offshoring brings with it the usual costs and benefits of any form of international trade. There is now abundant Canadian evidence that international trade lowers prices to consumers, raises productivity, and forces firms to be more innovative. For another, Canada is a major supplier of offshore services and some of our most dynamic companies are out there servicing customers in Boston, Berlin, Beijing and Bangalore. Finally, international trade has had no impact on the long-run level of Canadian unemployment. Thus, the primary negatives of offshore sourcing to date are that some Canadian workers have been (temporarily) displaced and that certain white collar occupations have experienced significantly lower wages.

E. *Policy Responses*

Most of the sensible policies aimed at fostering Canadian competitiveness in the service offshoring market are investment-promoting framework policies. They encourage Canadian workers, firms, and governments to invest in building productive assets such as human capital and new technologies. Such framework policies address a whole host of domestic competitiveness issues and so are not unique to issues raised by service offshoring. Nevertheless, it would be a mistake to think that this makes framework policies less central to issues raised by service offshoring.

Offshoring creates only a few new policy issues. First, it forces Canadian firms to be part of a global market and hence to compete globally. It thus makes framework policies that encourage investment and competitiveness all the more important. Second, it creates more churning among firms and workers, thus destroying human capital that is specific to worker-firm matches. We must think of policies that encourage these investments without at the same time creating the kinds of labour market inflexibilities that are the source of Euro-sclerosis. Third, it is important politically to find ways of helping workers displaced by service offshoring. Past trade adjustment assistance programs have largely been a waste; however, the skilled white collar workers that are currently in danger of being displaced are more easily helped than the unskilled workers displaced by low-end manufacturing imports.

2. What Is Offshoring?

There is no universal definition of offshoring and one task of the roundtable is to decide how broad a set of phenomena to examine. The approach taken by all commentators on offshoring is to attempt a careful definition. This is a natural, but misguided approach. We

must first start by identifying Canada's broad public policy objectives and then identify which aspects of offshoring enhance or impinge on our ability to meet these objectives. In my view there are two complementary objectives:

1. Promoting competitiveness and raising incomes.
2. Advancing core Canadian values of community and caring through redistributive policies.

The most interesting policies are the few that promote both objectives. These objectives will help us delineate the boundaries of a roundtable on offshoring by answering three definitional questions.

A. *Services and Manufacturing or Exclusively Services?*

In my view we should focus on services. What makes manufacturing interesting is the dramatic rise in manufacturing exports from low-cost countries, especially China. This export surge has already had a large impact on Canada's least-skilled workers in industries such as garments. See Hejazi and Trefler (1996) and Liu and Trefler (2005). It is now poised to threaten Canada's moderately skilled workers in such industries as auto parts. However, to my mind these developments pose no new public policy issues that haven't already been discussed in the context of conventional import competition.

On the other hand, the revolution in the world's ability to trade in services is something new. For one, this service trade makes use of some of the most dynamic modern technologies (IT). It thus has implications for the innovation policies which lie at the heart of Canada's current competitiveness policies. For another, at least some of the new service trade involves highly skilled white collar workers operating in low-cost countries such as India. Successful policy responses aimed at assisting skilled labour will likely be very different from policy responses aimed at assisting less-skilled labour. This distinction has had no play in the offshoring debate, but is likely crucial for reasons to be explained below. Thus, service offshoring poses new policy challenges not raised by manufacturing offshoring.

My view will find critics. Most researchers argue that the rise of China as the world's manufacturer poses such important challenges that it must be included in every discussion of international trade policy. I look forward to a healthy debate of this point.

B. *Inshoring, Nearshoring, Offshoring, or All of the Above?*

As I have already stated, the most interesting aspects of new trends in the tradability of services is the offshoring of technology-intensive, high-end services to low-cost countries.

However, 60% of Canada's offshoring is 'nearshoring' with the United States. Likewise for Western European nearshoring with Eastern Europe. Further, Canada is a major supplier of traded services to the rest of the world. For example, over 10% of the world's call centres are located in Canada. This exporting of services or 'inshoring' cannot be ignored.[1] Thus, all three phenomena must be examined.

C. *Outsourcing or Foreign Direct Investment (FDI)?*

'Outsourcing' describes an arm's length transaction between a Canadian firm and a foreign firm. In contrast, FDI describes a Canadian controlling equity investment in a foreign establishment. Recent theories of international trade make it clear that the distinction between outsourcing and FDI is intimately related to the question of whether Canada will retain the highest-paying jobs in the value chain or watch them migrate both to other OECD countries and to emerging low-cost countries such as China and India. One cannot understand this process without looking at what is called the 'make-or-buy' decision, that is, the decision about whether to produce in-house using FDI or to outsource using arm's length transactions.

In a nutshell, the new theories state that when a project is sufficiently routinized that it can be fully scoped or described then outsourcing is the appropriate relationship with a foreign service provider. When the project is difficult to describe from its outset, it should be done in-house via FDI. The difficult-to-describe projects are typically the innovative projects that generate the highest value added. Thus, we need to understand how firms choose between outsourcing and FDI if we are to understand how to keep high-paying jobs in Canada.

My suggestion is thus to study both outsourcing and FDI. Not all economists will agree. For example, Bhagwati, Panagariya and Srinivisan (2004) argue that we should only be thinking about outsourcing. On this one point, I think that Bhagwati, Panamanian and Sinicising are wrong.

D. *The Many Faces of Offshoring*

It is fitting to close out this discussion of offshoring by providing examples of its pervasiveness and the difficulties of further definitional refinements.

- Example 1 – Traditional 'mode 3' FDI in the service sector: The Bank of Hong Kong sets up an office in Canada that provides limited services to Canadian customers. The office is primarily staffed by Canadians and most of the key decisions are made in Hong Kong.

[1] Slaughter (2004) calls this 'insourcing'.

- Example 2 – Traditional 'mode 4' FDI in the service sector: A Canadian architectural firm sets up an office in Shanghai to bid and work on local contracts. The firm sends its Canadian architects to Shanghai on a long-term basis to do the design work. What distinguishes this from the previous example is that the control of decisions is largely in the hands of Canadians who have temporarily migrated to Shanghai.

- Example 3 – The service-trade revolution using an FDI mode of entry: Bell Canada sets up an IT centre in Bangalore which hires Indian programmers to write software for Bell's Canadian operations.

- Example 4 – The service-trade revolution with an outsourcing mode of entry: Satyam (India) sets up a contact centre that makes CIBC VISA marketing calls to potential customers in Vancouver.

The use of the term 'mode' comes from the IMF Balance of Payments Manual and is used by all OECD countries in presenting their data.[2]

Table 1 provides many more refined examples of the types of activities that I believe we should focus on. These examples are classified into four areas: (*i*) Contact centres or what are commonly called call centres, (*ii*) Back-office services, (*iii*) IT services, and (*iv*) Other high-end services.

E. *An Aside: On the Difficulties of Defining Offshoring*

It is worth noting two problems with refining the definition of offshoring. First, most of us would be comfortable with the following statement: "Manulife is *outsourcing* development of its new Human Resources software to India, while the plastic products industry is *importing* shopping bags from China." Why is one 'outsourcing' and the other 'importing'? In both cases, products currently made in Asia were previously made in-house in Canada and in both cases there has been phenomenal growth over the last 5 years. There are no good answers to this question.

Second, with the outsourcing of back-office jobs by manufacturing firms, we tend to think that the line between manufacturing and services is becoming cleaner. However, the opposite is also happening. When Microsoft introduced its Xbox game player, it hired Singapore-based Flextronics (the contract manufacturing giant) to build a factory in low-wage Guadalajara that was supplied with standardized parts from China. Design

[2]There are significant problems with the Balance of Payments data. For example, the data I will use to examine offshoring exclude mode 3 operations of foreign firms with a local presence selling to other locals. The excluded data are available in the OECD monograph *Measuring Globalization, Volume II*. The data I will use also exclude the bulk of mode 4 payments i.e., payments to people who have temporarily moved abroad in order to provide services locally. Unfortunately, Canada is one of the few OECD countries not to report such data.

Table 1. Definitions of Export-Oriented FDI Projects Related to Offshored Services

Contact Centre Services	**Back-Office Services**	**IT Services**
Help desk	Claims processing	Software development
Technical support/advice	Accounts processing	Application testing
After-sales support	Transaction processing	Content development
Employee enquiries	Query management processing	Engineering and design
Claims enquiries	Customer administration processing	Product optimization
Customer support/advice	HR/payroll processing	**Other High-End**
Market research	Data processing	Regional Headquarters
Answering services	IT outsourcing	Architectural services
Prospecting	Logistics processing	Biotech and pharma R&D
Information services	Quality assurance	Radiology, X-ray
Customer relationship management	Supplier invoices	Distance education

Notes: Information from UNCTAD and author.

of the core proprietary technology was outsourced to Nvidia Corp. of the Bay Area and manufactured in Taiwan. Clearly, Xbox could not have been brought to market in this way without tremendous logistics support. As such, Xbox is a manufactured product that embodies a significant service component. This example is commonplace. Accenture (2004) reports that 43% of its customers outsource their supply chain management. This reflects the rise of contract manufacturers that both manufacture and provide manufacturing service support.

Given these two difficult problems of definition (and other problems as well), finer definition of outsourcing seems impossible. I therefore adopt the approach of U.S. Supreme Court Justice Stewart in his attempts to define pornography:

> "I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description; and perhaps I could never succeed in intelligibly doing so. *But I know it when I see it ...*" (Jacobellis v. Ohio, US Supreme Court, 378 U.S. 184, 1964. Italics added.)

3. How Big Is Offshoring?

Every day the *Wall Street Journal* offers up a frenzy of offshoring items. Consider just a few of the announcements this month alone (February 2005). Accenture (formerly Anderson Consulting) is a global consulting, technology and outsourcing services provider whose Indian workforce rose from 4,300 to 11,000 in the last 12 months. This year's growth will continue apace as Accenture moves more of its 100,000 employees to facilities in Bangalore, New Delhi, Mumbai and Hyderabad. EDS (the IT service company) will be closing almost half of its 54 U.S. and European IT centres this year, a move that will add even more workers to its 32,000 employees who are already in offshore locations such as India. Convergys, the world's largest provider of contact centres, announced the opening of its eighth Indian facility. Convergys already has 10,000 employees in India and one wonders whether this is a harbinger of closures at any of Convergys's eight Canadian facilities. Cognizant, the IT services giant, employees about 10,000 workers in India and hopes to boost that to 22,500 by year's end. NASSCOM, India's National Association of Software and Services Companies, reports that India has added about 150,000 new software jobs in the last 2 years. Most of these jobs come not from the big U.S. firms noted above, but from Indian giants such as HCL, Tata and Satyam.

Getting a handle on the size of offshored services is very difficult – and impossible if one wants to distinguish FDI from arm's length service provision. The best source of published data is Canada's balance of payments data on service trade. See table 2. Canada exported $32.4 billion in commercial services in 2004.[3] It imported $36.1 billion. Not all of these services are of interest. The big traditional categories are communications services, insurance, financial services, and royalties and license fees. I suspect that much of this is characterized by my example 3 above; that is, a company such as Manulife sets up shop in Shanghai to service the local market.

From an offshoring perspective, the most interesting categories in table 2 are 'computer and information services' and 'other business services.' These are more likely to include services such as those provided by white collar workers in India to customers in Canada. These two categories together account for $20.4 billion in exports and $18.1 billion in imports. Thus, Canada runs a surplus of $2.4 billion for these goods.

Are these large numbers? There are several approaches to this question, each of which yields a different answer. One approach is to compare service trade to goods trade since we can all agree that goods trade is both large and growing fast. Canada's 2004 goods exports were $430 billion, completely overshadowing our $20 billion exports of offshored services. Thus, offshoring is small.

[3] 2004 figures are annualized using first 3 quarters of seasonally adjusted 2004 data.

Table 2. Canada's Service Trade and Offshoring of IT and Business Processes

	Exports		Imports		Net Exports
		Growth		Growth	
Service Provided	**2004**	**1997-2004**	**2004**	**1997-2004**	**2004**
Commercial Services	**$32.4**	**7%**	**$36.1**	**7%**	**-$3.8**
1. Computer and information services	**$2.9**	**8%**	**$1.6**	**7%**	**$1.4**
2. Other business services	**$17.5**	**7%**	**$16.5**	**7%**	**$1.0**
2.1 Non-financial commissions	$0.9	3%	$0.6	2%	$0.3
2.2 Equipment rentals	$0.3	6%	$0.7	7%	-$0.4
2.3 Management services	$3.6	9%	$4.7	8%	-$1.0
2.4 Advertising and related services	$0.4	9%	$0.6	3%	-$0.2
2.5 Research and development	$2.6	6%	$1.0	3%	$1.7
2.6 Architectural, engineering, other technical	$3.4	4%	$1.8	10%	$1.7
2.7 Miscellaneous services to business	$3.9	7%	$4.7	5%	-$0.8
2.8 Audio-visual services	$2.3	13%	$2.5	10%	-$0.1
3. Communication services	$2.3	3%	$2.2	3%	$0.1
4. Construction services	$0.1	8%	$0.1	-4%	$0.0
5. Insurance services	$4.6	3%	$6.6	4%	-$2.0
6. Other financial services	$1.5	4%	$2.4	6%	-$0.9
7. Royalties and licence fees	$3.3	23%	$6.7	13%	-$3.4
Total, trade in services	**$62.3**	**6%**	**$73.5**	**5%**	**-$11.2**
Total, trade in goods	**$430.3**	**5%**	**$363.0**	**4%**	**$67.3**

Notes: Data are in billions of Canadian dollars. The industries in bold are those that are most closely related to IT service outsourcing and business process outsourcing. Data are from the Statistics Canada publication "Canada's Balance of International Payments, Fouth Quarter 1998 and 2004".

However, this is a little misleading. Consider the example of a $5,000 engine block produced in Ohio that is shipped to Oshawa for assembly and then shipped back to the United States as part of a finished car. The value of engine block trade is $10,000, but the value added of engine block trade is probably only a few hundred dollars. In general, manufacturing value added is about one third of manufacturing output. Thus, the appropriate value-added comparison is $143 billion (= $430/3) in exports of goods as compared to $20 billion in exports of services. This suggests a small, but not inconsequential amount of service offshoring.

A third way of asking whether service offshoring is large is to examine its growth rate. It is not easy to capture the value-added growth component of goods exports, though it is probably much smaller than the shipments growth of 5% annually.[4] Computer information service exports grew by a spectacular 8% annually since 1997. Management consulting services grew by 9% and audio-visual service exports (e.g., film) grew even faster. These are impressive growth rates. Unlike my earlier conclusion drawn from the level of trade, my conclusion from growth rates is that offshoring will be very important in the future.

A. *Who Are Canada's Trading Partners?*

Table 3 breaks out Canada's commercial services trade by partner. These data are in U.S. dollars. In 2001, about 85% percent of our service trade was with the OECD and most of that was with the United States. This reminds me that the tail cannot wag the dog: our service offshoring to low-cost countries is so small that it cannot possibly have a large effect on the Canadian economy.

The trends give greater cause for concern. Between 1999 and 2001 our exports grew very fast to a number of countries. From table 3, compound annual growth rates between 1999 and 2001 were 22% for Ireland, 19% for Korea, 16% for India, 12% for Australia and 8-10% for China/Hong Kong. Also, our imports were growing fastest from India (21%), Hong Kong (18%), Ireland (18%), Germany (16%) and Korea (16%). If this spectacular growth continues, Canadian workers and firms may end up being the tail of an Asian dragon.

B. *Losing Out in the Value Chain: Canada's Weak Corporate Strategy*

How does Canada do relative to other economies? Table 4 paints a bleak picture. The table reports service offshoring by country. In particular, it reports exports and imports of computer and information services and of other business services. Canadian engagement

[4] All growth numbers are annual compound growth rates for the period 1997-2004.

Table 3. Canada's Service Trade: U.S. Dominates, But China and India Are Catching Up.

	Canada's Service Trade:					
	Exports			Imports		
Canada's Trade with	2001	Share of Exports to the World	Annual Change 1999-2001	2001	Share of Imports from the World	Annual Change 1999-2001
WORLD	38 021	100.0%	3%	43 439	100.0%	3%
TOTAL OECD	32 052	84.3%	2%	37 094	85.4%	3%
United States	**22 616**	**59.5%**	**1%**	**26 762**	**61.6%**	**2%**
United Kingdom	2 305	6.1%	2%	2 469	5.7%	-6%
Japan	1 098	2.9%	4%	1 369	3.2%	6%
Germany	1 090	2.9%	4%	993	2.3%	16%
France	1 060	2.8%	6%	1 054	2.4%	0%
Ireland	556	1.5%	22%	292	0.7%	18%
Korea	442	1.2%	19%	161	0.4%	16%
Australia	408	1.1%	12%	291	0.7%	-3%
Switzerland	391	1.0%	7%	409	0.9%	0%
Netherlands	335	0.9%	8%	447	1.0%	11%
Sweden	321	0.8%	3%	137	0.3%	1%
Mexico	292	0.8%	7%	613	1.4%	11%
Italy	230	0.6%	9%	469	1.1%	13%
Greece	108	0.3%	-21%	442	1.0%	3%
Norway	90	0.2%	10%	286	0.7%	18%
Other OECD	612	1.6%	5%	797	1.8%	14%
Total Non-OECD	5 969	15.7%	4%	6 345	14.6%	8%
China	**489**	**1.3%**	**8%**	**380**	**0.9%**	**18%**
Hong Kong, China	**468**	**1.2%**	**10%**	**594**	**1.4%**	**3%**
Taiwan	295	0.8%	-8%	182	0.4%	7%
Brazil	227	0.6%	-2%	143	0.3%	10%
India	**191**	**0.5%**	**16%**	**155**	**0.4%**	**21%**
Singapore	181	0.5%	13%	441	1.0%	11%
South Africa	123	0.3%	15%	44	0.1%	9%
Indonesia (9)	119	0.3%	-9%	74	0.2%	10%
Israel	112	0.3%	7%	77	0.2%	-7%
Philippines	105	0.3%	12%	96	0.2%	-8%
Saudi Arabia	101	0.3%	14%	136	0.3%	16%
Russian Federation	99	0.3%	5%	154	0.4%	9%
Malaysia	94	0.2%	-12%	59	0.1%	-3%
Thailand	85	0.2%	13%	91	0.2%	18%

Notes: Millions of U.S. dollars. Data are from the OECD.

Table 4. Canada: Lagging Again?

Country	Exports 2002	Exports Growth: 1997-2002	Exports Growth: 1992-2002	Imports 2002	Imports Growth: 1997-2002	Imports Growth: 1992-2002	Net Exports 2002
Computer and information services							
Ireland	$10,377			$545			$9,832
USA	$6,930	6%	16%	$4,193	20%	34%	$2,737
Germany	$5,162	17%	24%	$6,096	14%	19%	-$934
UK	$4,463	14%	14%	$1,664	18%	6%	$2,800
Canada	**$1,960**	**12%**	**11%**	**$883**	**5%**	**7%**	**$1,077**
Sweden	$1,469	36%	24%	$865	25%	21%	$604
Japan	$1,140	-4%		$2,149	-10%		-$1,008
Hungary	$194	18%		$155	13%		$39
Czech Republic	$142	26%		$121	23%		$20
Korea	$20	37%	13%	$124	13%	7%	-$104
Other business services							
USA	$60,766	9%	10%	$41,647	12%	12%	$19,119
UK	$38,824	9%	10%	$18,724	11%	10%	$20,100
Germany	$27,847	2%	6%	$39,002	6%	6%	-$11,155
Japan	$17,408	-4%	0%	$24,703	-5%	0%	-$7,294
Canada	**$9,105**	**3%**	**8%**	**$8,738**	**3%**	**6%**	**$367**
Sweden	$8,629	19%	15%	$9,416	21%	15%	-$788
Korea	$6,245	-6%	8%	$10,696	6%	15%	-$4,451
Ireland	$4,935			$18,745			-$13,810
Hungary	$2,226	20%	2%	$2,665	16%	5%	-$439
Czech Republic	$1,411	2%		$2,164	10%		-$753
Mexico	$255	-16%	-6%	$1,085	2%	0%	-$830

Notes: Data are in millions of U.S. dollars. Data are from the OECD.

in IT-intensive service offshoring is high. We are in the top-5 internationally. However, we are falling behind fast. Our service offshoring growth rates are small relative to many other countries. Table 4 reveals a profound problem with Canadian corporate strategy.

Table 5 drills down deeper into four sectors. It reports the result of a UNCTAD survey of FDI projects recorded in 2002 and 2003. See UNCTAD (2004). The table shows Canada was home to 56 new call centres during the 2002-2003 period. This represents 11% (= 56/513) of all new call centres.

Call centres are low on the value-added chain. IT services are much higher. For IT services, Canada was home to only 14 of 632 new centres established during the 2002-2003 period. This represents only 2% of all such call centres! The pattern in table 5 is frightening. India and China are doing far better than Canada in moving up the value chain.

We need to understand why Canadian firms are not doing better at inshoring and offshoring. We also have to help them understand the pros and cons of outsourcing. Accenture (2004) reports that many firms are not happy with offshoring. 30% of firms fail to reduce costs and 35% of firms fail to improve processes. Among firms that have been outsourcing for less than 8 years, 41% report that they strongly disagree with the statement that "Outsourcing has helped my company perform better" Clearly, Canadian firms need more guidance.

C. *Future Trends*

In the long run, the service offshoring market must become saturated. Are we anywhere near that point now? Point estimates of the growth of the service offshoring market vary dramatically, but all of them are large. UNCTAD (2004) cites a prediction that offshore *outsourcing* of business processes will grow from $1.3 billion in 2002 to $24 billion in 2007. This prediction is for a narrow segment of service trade and thus may be overstating trends in other segments. However, it remains true that most firms have not even begun to offshore their ancillary services. UNCTAD's 2004 survey of the top 500 European firms reveals that only 39% had experience with offshoring of business services. Similar numbers appear in other studies. There thus appears to be many firms that have only just begun the process of service offshoring.

D. *Directions for Future Research*

It would be valuable to have more information about the size and nature of service offshoring. There are several data sources that have not been exploited. Following Bartel, Lach and Sicherman (2005), it would be interesting to know which industries are outsourcing and what are the determinants of the outsourcing decision. Bartel et al. work with older

Table 5. Canada Stuck in Low Value-Added Segments

Region/economy	Total	Call Centres	Shared Service Centres	IT Services	Regional HQs
World	**1849**	**513**	**139**	**632**	**565**
Developed countries	**959**	**279**	**48**	**293**	**339**
Developing economies	**799**	**203**	**72**	**315**	**209**
India	228	60	43	118	7
United Kingdom	187	43	7	73	64
China	132	30	4	60	38
United States	123	15	2	26	80
Canada	**98**	**56**	**3**	**14**	**25**
Singapore	95	16	8	35	36
Germany	77	20	1	34	22
Ireland	77	29	19	14	15
Australia	72	19	3	26	24
United Arab Emirates	56	13	0	12	31
Hong Kong, China	53	2	0	14	37
Netherlands	52	13	3	16	20
Malaysia	47	16	6	8	17
France	42	13	2	16	11
Sweden	42	14	1	14	13
South America	40	13	4	16	7
Japan	35	11	0	16	8
Denmark	27	5	1	6	15
Spain	27	8	2	8	9
Switzerland	26	5	0	7	14
Philippines	26	12	1	9	4
Hungary	26	11	7	4	4
Belgium	22	7	1	5	9
Africa	22	7	1	10	4
Brazil	21	6	0	9	6

Notes : Data are from UNCTAD (2004).

U.S. manufacturing data. Statistics Canada publishes data on outsourcing by industry (both manufacturing and non-manufacturing) and by type of service outsourced. See *Canada's International Trade in Services, 2001*, table 8. These data come from Canada's surveys of international service trade. It would be of considerable interest to work with the survey's underlying firm-level data.

The U.S. Bureau of Economic Analysis has an extensive dataset on the behaviour of U.S. multinationals operating abroad and foreign multinationals operating in Canada. These data have been used extensively by a large number of researchers e.g., Hanson, Mataloni and Slaughter (2003). Canada has some comparable data, but its extent must be clarified.

Another possibility is to work with visa data for both Canada and the United States. Often a Canadian firm that is offshoring to India will invite its Indian partner to Canada for the week or even for several months. This leaves a visa paper trail of offshoring. Possibly such data can be combined with data on payments to workers under 'misc. business services' of the balance of payments accounts.

Section B provides a rich set of research questions about Canada's failing grade in moving up the inshoring and offshoring value chains. For example, what is the role of time-based competition (Stalk and Hout, 1990) and weak clusters? We also need to encourage Statistics Canada to design surveys that better measure the extent of service offshoring. Ideally, this information would be linked to other firm characteristics such as wages, employment, productivity, and innovation.

4. The 64,000 Job Question: Wither China and India?

Behind the alarm about service offshoring is a sense that OECD countries are in danger of being overtaken by China, India and a number of other developing-country destinations for service offshoring. In the most alarming scenario, these countries have an infinite capacity to absorb OECD technologies and management strategies, to improve on them, and ultimately to compete head-to-head with the OECD. Finally, in this scenario, China and India with their newly acquired high-tech status will continue to have low wages for skilled labour and will use this advantage to create an economic steamroller that crushes the OECD countries.

There are two reasons why this argument is flawed. First, there is an ironclad economic law that prevents a country from ever dominating world trade. Second there are political-economic reasons to doubt the speed at which this scenario can unfold. I review these reasons in detail.

A. *The Ironclad Law of Comparative Advantage*

I am a better researcher than my secretary. Surprisingly, I am also a better typist than he is. That is, I have an *absolute advantage* over my secretary in both research and typing. Nevertheless, I find my secretary to be indispensable. That is because I am relatively better at research than typing. Thus, if I typed an hour less a day I could write one page of this report whereas if my secretary typed an hour less a day he could only write one sentence of this report. In economic jargon, I have a *comparative advantage* in research and my secretary has a comparative advantage in typing.

In the most alarmist scenarios about China and India, these countries will soon have an absolute advantage in producing all goods and services. However, Canada will continue to have a comparative advantage in the most knowledge-intensive goods and services. Thus, even in the most alarmist scenario, Canada will continue to export knowledge-intensive goods and services to China and India.

With their low wages, what prevents these countries from exporting everything and importing nothing? If they import nothing they will be giving their goods away for free. I doubt they would agree to this. In addition, Canada will need Renminbi to buy Chinese goods. As we demand more of their currency it will rise in value. Eventually the Renminbi will rise so much in value that Chinese wages are no longer so dominantly competitive. (This is exactly the problem Canada faces in exporting to the United States in a period where our currency is strengthening.)

In real life there are things China can do to slow this process down, but China cannot forever keep the Renminbi undervalued. This is an ironclad law. Countries such as Germany in the 1960s and Japan in the 1970s ran afoul of the comparative advantage police. They ran huge trade surpluses that threatened to destroy U.S. and Canadian manufacturing. Over time, however, their currencies strengthened to the point where these countries ceased being low-cost producers. In this context it is important to remember that in 1959 Japan had a highly skilled and disciplined labour force that was paid 12% of Canadian wages. Japan in 1959 was, from the limited perspective of offshoring, not that different from China today. Yet Japan never was able to dominate world manufacturing. Why? Because Japan succumbed to the comparative advantage police by steadily revaluing the Yen.

The same will eventually happen to China. It does not matter that they have hundreds of millions of citizens ready to work for next to nothing. If we buy too much from them, their currency will rise to the point where their low Renminbi-denominated wages are wiped out by the currency conversion. It does not matter that Chinese workers are paid 100 Renminbi an hour for the next hundred years. If the Renminbi strengthens, Chinese dollar-denominated wages will rise. Like the Mounties, the comparative advantage police

always get their man.

B. *Institutions and the Mystery of Modern Economic Growth*

The comparative advantage argument has one significant limitation. It is possible that China and India develop a comparative advantage in knowledge-intensive goods and services, leaving Canada to produce T-shirts for the Shanghai market. In this scenario, Canada continues to export to China according to the law of comparative advantage. However, Canada becomes poor relative to China and possibly even in absolute terms. The argument for absolute impoverishment was first made by Graham (1923) and has been repeated by Hicks (1953), Johnson and Stafford (1993), Gomory and Baumol (2000) and most recently by Samuelson (2004). While the argument is logically correct, fortunately for Canada it is irrelevant. The problem with the argument is that it presumes that China and India will become the world's technological leaders. Such a presumption is in flagrant contradiction to what we know about the role of domestic institutions for promoting innovation.

Current thinking about the determinants of long-term economic growth focuses on the central role of domestic institutions. See Helpman (2004) for a review of the literature. In this view, there are limits to what China and India can produce under their current political-legal-economic regimes. As China and India expand the range of services they provide, they will eventually enter into services that depend on constant innovation. In the new institutions-and-growth view, innovation cannot occur without institutions that protect property rights, that provide a fully functioning legal framework for arm's length transactions, that support thick equity and debt markets and that balance the needs of inside innovators against those of outside investors.

In short, China and India will not be able to compete in innovation-intensive service provision without the 'institutions of modern capitalism' (Rosenberg and Birdzell, 1986) and its handmaiden, 'the invention of invention' (Mokyr, 1990). For China and India to compete over the very long haul, their institutions will have to look a lot more like OECD institutions. This is unlikely even over a quarter-century horizon.

C. *Evidence on the Importance of Institutions for Long-Run Growth*

Figure 1 provides two examples of a now-burgeoning institutions-and-growth literature. The top panel plots GDP per capita in 1997 against the Kaufmann, Kraay and Zoido-Lobaton (1999) rule of law index. This index ranks countries based on the degree of rent-seeking or opportunistic behaviour that investors are exposed to. For example, when I make an equity investment in a Canadian company I have some confidence that I will see my money again – not always, but usually. In contrast, my equity investment in China is

much more likely to be siphoned out of the company and forever lost to me. The figure 1 R^2 of 71% shows just how much rent-seeking behaviour can retard growth.

The bottom panel plots GDP per capita against the Gwartney and Lawson (2003) legal quality index. This index captures the ability of firms to write enforceable contracts. The need for rule of law governing commercial transactions is obvious. In section 5, I will show just how important it is for understanding offshoring. The bottom panel of figure 1 shows just how important is the quality of legal institutions for growth.

D. *Institutions in China and India*

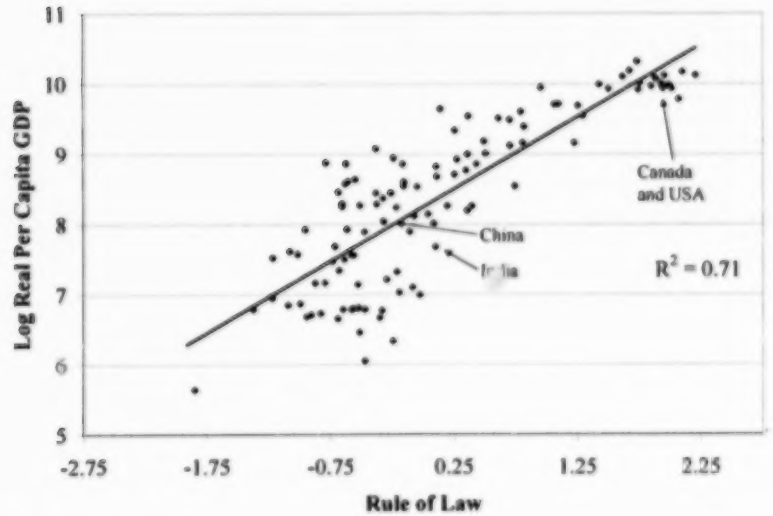
Rich countries have good institutions. The quality of Chinese and Indian growth-enhancing institutions is at best moderate. Historically, very few countries experience rapid improvements in their domestic institutions. Rather, institutions develop at a glacial pace, over a century or more. The idea that China or India can rapidly develop these institutions is a complete misread of the sources of modern economic growth.

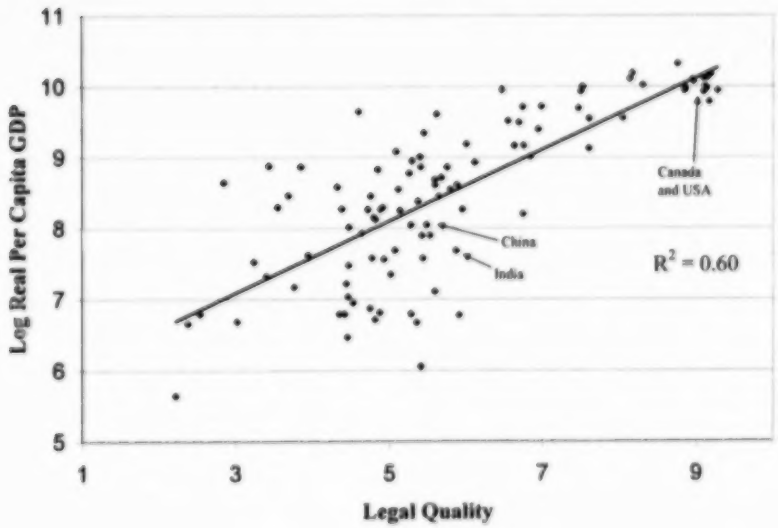
How does this pan out in the specific contexts of China and India? In private conversation with Wendy Dobson, she identifies 5 weaknesses in Chinese and Indian institutions: (1) The role of the government – particularly state-owned enterprises and corrupt officials – in preventing the efficient reallocation of resources such as capital. (2) A weak financial system that leaves firms under-resourced. (3) A social safety net that leads to labour market inflexibilities. (4) A lack of an endogenous capability to innovate, in part because entrepreneurs are hemmed in by the rent-seeking behaviour of bureaucrats. (5) A one party state in China and a corruption alliance between bureaucrats and politicians in India that retards the development of a local entrepreneurial class. While some of these institutional impediments are slowly evaporating, it will take decades before they all disappear.

E. *An Application to the Worldwide Software Industry*

To make the argument about institutions less abstract, consider how it plays out in the emerging centres of the worldwide software industry, that is, in China, India, Brazil, Ireland, and Israel. Table 6 from Arora and Gambardella (2005) presents data on the software industry. The industry is very large in India, China and Brazil. The combined employment of these three countries is 600,000, approaching the U.S. level of 1,024,000. On the other hand, sales per employee are very small in these countries. A U.S. software employee generates almost $200,000 of sales per employee, four times more than an Indian employee. This means that China, India and Brazil are providing low value-added programming skills. Will the software industry in these low-cost countries grow and enter

Figure 1. Good Institutions Promote Growth





Notes: Data from Kaufmann et al. (1999) and Gwartney and Lawson (2002).

Table 6. The Software Industry Worldwide

Countries	Sales ($US billion)	Employment (1000s)	Sales / Employment (1000s)	Software sales / GDP
Brazil	7.7	160	46	1.5%
China	13.3	190	38	1.1%
India	12.5	250	50	2.5%
Ireland (MNE)	12.3	15	804	10.1%
Ireland (Domestic)	1.6	13	127	1.3%
Israel	4.1	15	273	3.7%
United States	200.0	1,024	195	2.0%
Japan	85.0	534	159	2.0%
Germany	39.8	300	133	2.2%

Notes : The software industry in Brazil, China, India, Ireland, and Israel compared to the United States, Japan, and Germany in 2002 or latest available year. The source is Arora and Gambardella (2005).

into higher valued added segments? Three significant institutional factors may prevent this.

1. *Long-term software growth must be primarily driven by domestic developments.* Apart from India, the software industries in these countries developed in response to local needs (Arora and Gambardella, 2005). Banking and telecommunications drive software growth in Brazil and China, software growth in Israel was driven by Israel's high-tech sector and software in Ireland developed by providing services to multinationals using Ireland to enter the European market. In each case, domestic factors drove the initial growth: exports came later. The message then, is that the institutions that promote domestic-led growth must be in place.

2. *Clusters.* In order to have domestic-led growth, many pieces must fall into place simultaneously. For example, the weak financial systems in China, India and Brazil leave firms under-resourced because insiders routinely steal from outside investors. Thus, firms in these countries are short not only on capital, but also on sophisticated financial advice provided by banks and venture capital firms. Further, downstream demanders of software such as banks are also underdeveloped because of poor national institutions. Thus, software firms are missing sophisticated buyers who will push them to innovate and upgrade their products (Porter, 1998). It is sometimes argued that R&D follows production. Thus, as the low end of the software industry migrates to India, product development will also migrate. Indeed, NASSCOM boasts many new products. However, available evidence suggests strong limits to this process. Audretsch and Feldman (1996) show that as an

industry matures and manufacturing moves to low-cost locations outside of the cluster, R&D continues to occur inside the cluster. Jaffe, Trajtenberg and Henderson (1993) explain why. Much of what is important for on-going innovation involves the local exchange of tacit information, that is, information which cannot be codified and which can only be communicated face to face. All of this implies institutional limits to the development of an increasingly sophisticated software industry in China, India, and Brazil.

2. *National Innovation Systems:* A skilled labour force is critical for the growth of a domestic software industry. China, Brazil, and India each have a large and growing university system. Each turns out about as many natural science and engineering degrees as the United States e.g., Bardhan and Kroll (2003) and Arora and Gambardella (2005). It is often argued that this provides these countries with cheap skilled labour. I am more skeptical. If skilled labour is so abundant, why are IT-sector wages rising by 15% a year in India? The answer, as Canadians know, is that there is often a significant gap between what the university provides and what the private sector needs.

The most successful country in the world in bridging this gap has been the United States. Rosenberg (1997) shows how the U.S. university system co-evolved with private sector needs. As a result, the U.S. university system has an unparalleled curriculum vitality. Further, Rothschild (2003) argues that the continued success of the U.S. university system has been driven by competition. On the one hand, U.S. universities compete fiercely amongst themselves for the best faculty and ideas. On the other hand, the system has diverse revenue sources and the many funders of U.S. university research compete amongst themselves to fund the best projects. As a result, there is no misdirected top-down injunctions about how to run engineering schools and good ideas are rarely suppressed.[5] Universities in China, Brazil, and India are able to crank out large numbers of graduates, but they will be unable to train the world's best graduates for many decades to come.

3. *International technology transfer.* There can be little doubt that OECD multinationals are teaching China and India how to compete. There is also an argument that we are selling ourselves short by under-pricing these technology transfers. However, for better or worse, in an open society it is virtually impossible to act differently than we are currently doing. How far will the process of international technology transfer go? Figure 2 provides evidence on this point. It plots the share of a country's imports that are done as intra-firm trade. This is plotted against the country's intellectual property-rights regime (Ginarte and Park, 1997). Countries with strong protection of intellectual property rights are the favoured destination of multinational enterprises (MNEs): these companies go where

[5] I will resist the temptation to comment on how the fact that Canada's university system has just a handful of funders, usually public funding agencies with politically driven research agendas, seriously jeopardizes our ability to compete internationally.

Figure 2. Good Institutions Promote Multinational Activity (Intrafirm Trade)

Notes: From author's calculations from the U.S. Bureau of Economic Analysis data on FDI.

institutions are strong. Thus, weak institutions in China, India and Brazil will place a limit on technology transfer in the software industry.

This section has demonstrated in the context of the software industry that weak Chinese, Indian and Brazilian domestic institutions will prevent these countries from migrating too far up the software value chain. Canada need not worry that in the next 20 years we will be reduced to mending the socks of Chinese businessmen.

5. The Determinants of Outsourcing: The Contracting Environment

The rise of service offshoring has two main drivers.

1. *Technological improvements in the information and communications technology (ICT) sector*: These improvements launched what UNCTAD (2004) calls the 'service tradability revolution.' While the financial sector has been using ICTs for 15 years, developments of the past five years have dramatically reduced costs to the point where ICTs are cheaply available to all.

2. *The new 'openness' consensus among political coalitions in developing countries*: In the Spring of 1992, Deng Xiaoping used a tour of southern China to call for a radical

Figure 3. Importance of Factors in Choosing an Outsourcing Provider

Notes: Data are from Accenture (2004).

opening up of the Chinese economy to both domestic and foreign competition. Since then, southern China has been growing at 25% a year. Likewise, the 1991 financial crisis in India led to the dismantling of tariffs and restrictions on FDI. Across the developing world there has been a wave of reforms aimed at integrating these low-cost countries into the world economy.

The rise of manufacturing offshoring has also been greatly facilitated by reductions in transportation costs and improvements in transportation logistics.

Conventional wisdom has it that firms go offshore to reduce costs, usually to low-cost countries. This is a misleading view. For one, we have already seen that 85% of Canada's service offshoring is with other OECD countries. For another, many firms enter foreign markets to improve access to skilled workforces, to enter rapidly growing markets and to be closer to customers. Accenture (2004) reports that lower costs is only third on the list of the most important factors in choosing an outsourcing provider. See figure 3. The first two are service providers' expertise and/or capability and service providers' flexibility.

What is most interesting about the list in figure 3 is that most of the items cannot be easily codified or written down in a contract. Mirroring this fact, less than a third of the

firms in the Accenture study feel that their outsourcing contract is the key framework for managing the outsourcing relationship. The former CEO of one of Canada's largest corporations relates the story of the lengthy contract negotiations he had for a greenfield investment in China. Years of negotiating with the Chinese culminated in a party to celebrate the conclusion of the contract talks. At the party, the Chinese host turned to the CEO and candidly told him that the contract meant nothing to the Chinese partners and that it was only signed to make the CEO comfortable! For the Chinese partners, the important thing was that they trusted the CEO.

A. *The New Theories of Offshoring: Trade and Contracting*

The difficulty of writing and enforcing contracts has led to a new generation of theories about offshoring that focuses on contractual incompleteness. The core idea is that parties to a contract cannot specify all possible future contingencies. For concreteness, suppose that an Indian service provider is required to make an up-front investment in customizing software for a Canadian buyer's human resource (HR) needs. Also suppose that there is only a single outcome of interest, namely, the 'quality' of the software. I make the extreme assumption that a court cannot judge quality or observe anything that might be informative of quality. The contract is incomplete in the sense that the court cannot properly enforce it. As a result, *after* the customization investment is made, there is a bilateral hold-up problem. The buyer would like to offer a lower price for the software than initially agreed to.

Of course, the Indian service provider is no fool. He fully anticipates that the buyer will renegotiate and so takes steps to protect himself. In particular, the Indian service provider will underinvest in customization. Figure 4 illustrates this point. There are a continuum of buyers spread out on a circle. Each point on the circle represents one buyer's ideal HR software needs. There are a finite number of Indian service providers, three in figure 4. A buyer wants to find a service provider who is a perfect match, but in general will not find one. Instead, the buyer will have to ask the service provider to make a relationship-specific investment in customization.

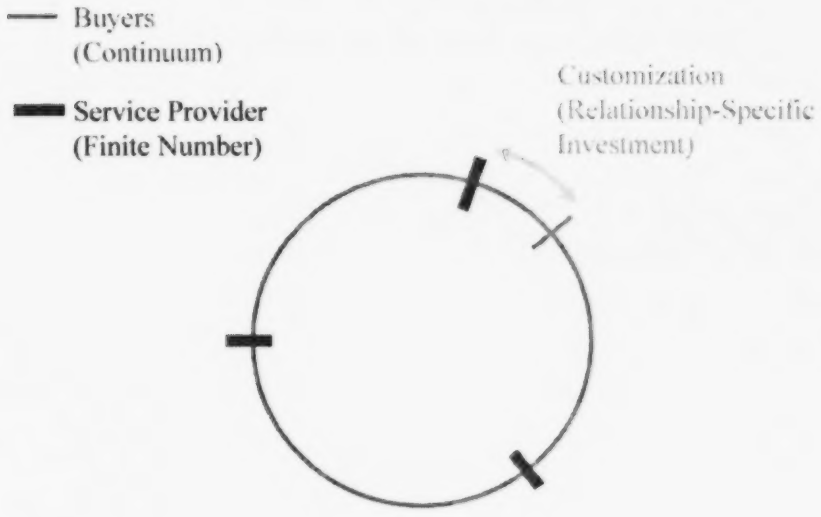
There are several steps in the timeline of this analysis.

1. The buyer and service provider match.

2. The buyer chooses an organizational form. That is, the buyer decides whether to outsource or to vertically integrate by buying the service provider's firm.

3. The service provider chooses a level of relationship-specific investment in customization.

Figure 4. *Ex Post* Renegotiation Leads to Inefficient Underinvestment in Customization



4. The buyer renegotiates.

The question is, should the buyer use outsourcing or vertical integration (e.g., FDI) as the mode of securing customized HR software? The answer depends on the outside options of the service provider. If the service provider can turn around and find another buyer whose HR software needs are similar to the original buyer's needs, then the service provider can walk away from the old relationship and start up a new one at little cost. In this case of good outside options, the service provider is not overly concerned with hold-up problems and so makes most of the necessary customization investments. This means that the buyer does not have to incentivize the service provider to make up front investments. Logic dictates that in this scenario the buyer should outsource. In contrast, if the service provider's outside options are poor, he will be concerned about hold-up, will not make the customization investments, and will provide low-quality service. The buyer will then have to vertically integrate operations if the buyer wants to control up-front investments in customization. Thus, the decision to outsource or vertically integrate depends on the degree of hold-up which in turn depends on (*i*) the outside options available to the service provider and (*ii*) the quality of contract-enforcement institutions such as the legal system and government rent-seeking behaviour.

A key issue is the question of precisely how vertical integration provides the right incentives for the service provider to invest in customization. The earliest forms of these models were based on what is called the *Transactions Cost Theory* of the firm. See Coase

(1937), Williamson (1975, 1985), Klein, Crawford and Alchian (1978) and Grossman and Helpman (2002, 2003).

A problem with this approach is that it assumes that vertical integration magically eliminates hold-up problems within the firm. But how does this happen? After all, service providers within the firm still have incentives to under-invest by shirking. To address this concern, Grossman and Hart (1986) and others developed the *Property Rights Theory* of the firm. In this theory, the focus is on how the service provider's incentives are altered by allowing or not allowing the service provider control over the buyer's core asset.

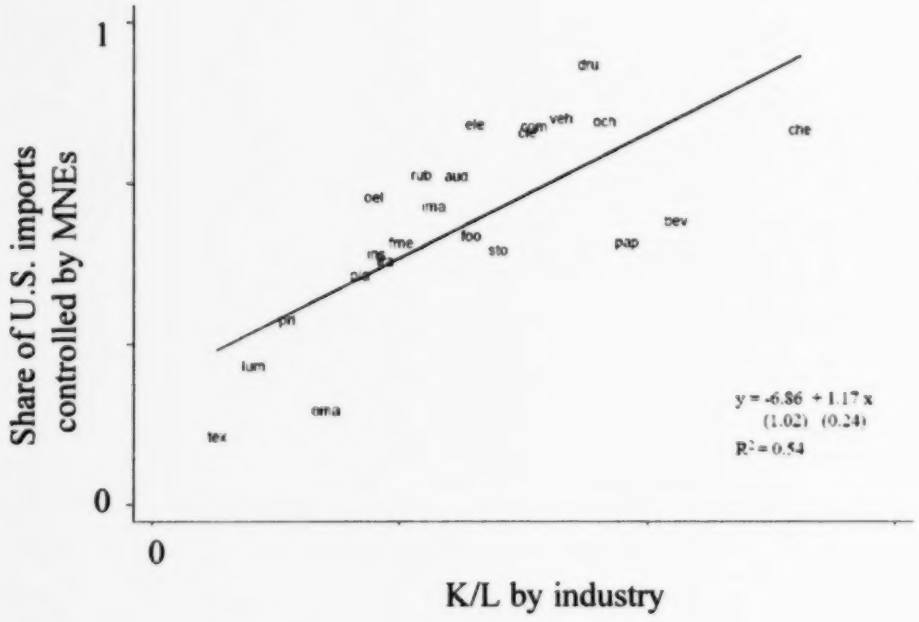
In particular, control of the relationship-specific asset is given to the party whose effort most influences profits. If the buyer's input into developing customized HR software is crucial, then it should be done in house. If the buyer can scope the project with precise specifications then what is needed most is to provide high-powered incentives to the service provider. This is done by making the service provider the residual claimant on profits i.e., by outsourcing. This insight has been built into models of offshoring by Antràs (2003, 2005), Grossman and Helpman (2005), and Antràs and Helpman (2004).

Two related papers that are less about the inability to write complete contracts than about the unwillingness of courts in developing countries to enforce them appear in Markusen (2001) and Nunn (2005).

B. *Empirical Evidence Supporting the New Trade Theories*

It is useful to review the two papers that combine theoretical insights with empirical support. These are Antràs (2003) and Nunn (2005). In Antràs (2003), both the buyer and the service provider make relationship-specific investments. The buyer invests capital and the provider invests labour. With outsourcing, each party's outside option in the renegotiation stage is 0 so there is underinvestment by both parties. With vertical integration, the buyer is allowed to take a fraction δ of the provider's output. Thus, the buyer's outside option is δ and the provider's outside option is 0. Thus, relative to outsourcing, vertical integration induces more investment by the buyer and less investment by the provider. Restated, vertically integrated activities will be relatively more capital intensive than outsourced activities. This yields an important empirical prediction. The larger is capital's share of an industry, the more sensitive are profits to the buyer's capital underinvestment. Hence, the property rights approach predicts that vertical integration will be the dominant organizational form. This is exactly what we see in figure 5. Each point in the plot is an industry. The data plot an industry's capital-labour ratio against the share of U.S. imports for that industry that are imported by MNEs. The more capital intensive is the industry,

Figure 5. The Share of U.S. Imports Controlled by MNEs Rises in the Capital Intensity of the Industry



Notes: Data are from Antras (2003).

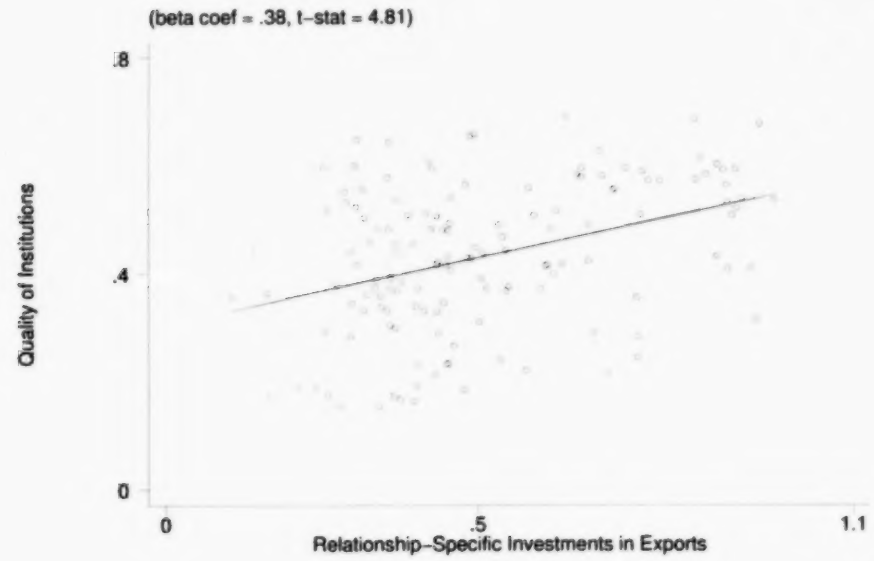
the larger is the share of U.S. imports that are vertically integrated within an MNE.[6]

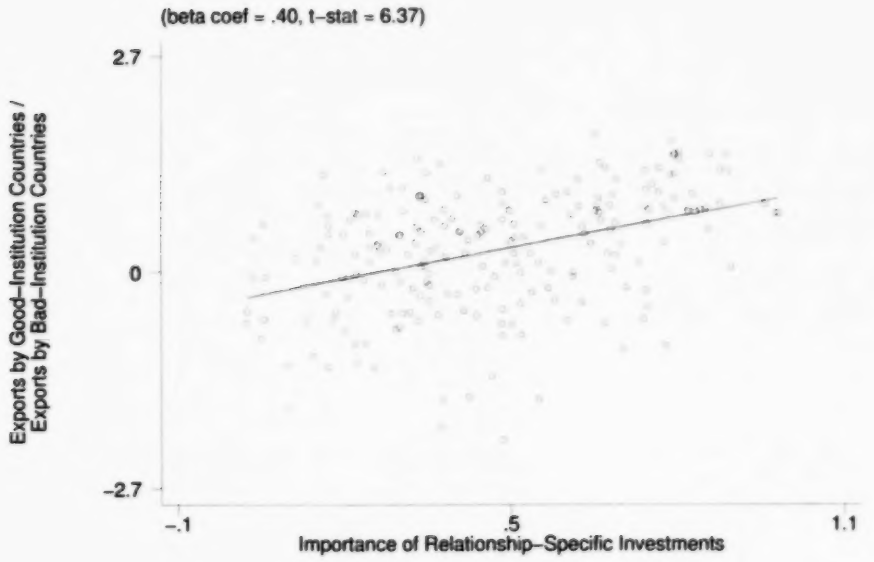
Nunn (2005) changes the focus slightly. Instead of being interested in the inability to write complete contracts, he is interested in the extent to which a country's legal system appropriately enforces contracts. In particular, in countries with poor contract-enforcement institutions, buyers and service providers will be unwilling to make relationship-specific investments for fear that they will expose themselves in court to hold-up problems. Thus, goods requiring substantial relationship-specific investments will tend to be produced in countries with good contract-enforcement institutions.

Figure 6 provides Nunn's evidence on this mechanism. In the top panel of figure 6 each point is an industry. Countries with strong institutions (as measured by the rule of law) tend to export goods that require large relationship-specific investments. In the bottom panel of figure 6 each point is a pair of countries. Relative to countries with a weak rule of law, countries with strong rule of law have exports that are skewed towards goods requiring large relationship-specific investments.

[6] Note that this is manufacturing trade rather than service trade and that outsourcing is any arm's length transaction.

Figure 6. Contract Enforcement and Comparative Advantage





Notes: Data are from Nunn (2005).

We tend to think that offshoring is almost exclusively driven by the search for low-cost labour. This is simply not true. 85% of Canada's service offshoring is with other OECD countries. Many firms enter into service offshoring relationships in order to gain access to a skilled workforce, to be in a rapidly growing market or simply to be closer to customers. For many firms, the problem of offshoring to low-cost countries is the contracting environment. These countries do not have the legal institutions that allow firms to write complete and enforceable contracts. As a result, opportunistic behaviour by local entrepreneurs, bureaucrats and politicians leads to hold-up problems, underinvestment in the relationship, and ultimately, in an unsatisfactory offshoring experience. China in the 1990s was massively subject to these hold-up problems. Clissold (2004) provides a vivid description of just how terrifying the weaknesses of China's legal system were to foreign investors. Things are improving, but only slowly.

6. Costs and Benefits of Offshore Sourcing

Detailed calculations of the effects of offshoring over longer horizons such as 15-20 years are nearly impossible. It would require one to take a strong position about exactly how Chinese and Indian institutional impediments will reduce their offshoring capability. In this section I take a much shorter view and review what the costs and benefits of offshoring have been *to date*.

A. *General Observations about the Impact of Trade on Productivity and Jobs*

We had better start with a basic fact: international trade is good for productivity growth. The Canadian evidence on this is clear. Trefler (2004a) shows that the Canada-U.S. Free Trade Agreement raised productivity by 15% in the most affected manufacturing plants. This is an enormous number, large enough to close the Canada-U.S. productivity gap if carried over to the entire economy. On the other hand, Trefler also finds that the Agreement led to substantial short-run worker displacement: roughly one in eight jobs in the most affected plants disappeared and the displaced workers were forced to find jobs elsewhere. Finally, the Agreement did not affect the long-run unemployment rate: most of the displaced workers were able to find jobs in the robust post-Agreement Canadian manufacturing sector.

How does this discussion of manufacturing trade relate to service offshoring? To date, all studies of the impact of offshoring take as a starting point the argument that offshoring is not conceptually different from other forms of import competition and thus tend to end up with results similar to those in Trefler (2004a). I review these findings and then revisit the question of the extent to which offshoring is really the same as past trade in goods.

B. *Offshoring as a Source of Productivity Growth*

There is currently a huge Statistic Canada research effort aimed at understanding why freer trade raises Canadian plant-level productivity. See Baldwin, Caves and Gu (2004), Baldwin and Gu (2003), Baldwin and Gu (2004), Baldwin and Gu (2005) and Lileeva (2004). While no definitive results are in yet, the plant-level productivity gains were likely the result of directed, strategic change by managers that placed a focus on upgrading and innovation. First, successful plants refocused by reducing the number of products produced per plant. This is likely the result of offshoring. Second, R&D spending rose as did investments in advanced manufacturing technologies. These may also have been spurred by offshoring – by reducing costs and raising profits, offshoring provides firms with deeper pockets for the investments necessary to raise productivity. Further research into this topic is essential.

Another source of productivity gains from offshoring flows from the fact that offshoring provides firms with better and cheaper access to inputs. This is a well-documented fact for manufactured goods and Mann (2003) has recently extended the logic to offshored services. Mann starts by observing that IT offshoring is moving its focus from hardware to software. She then argues that what was true of the productivity effects of IT hardware offshoring over the 1990s and early 2000s is a good predictor of the productivity effects of IT software offshoring today. Through very careful analysis that draws on a large body of detailed productivity analysis, Mann shows that globalized production and international trade reduced the cost of IT hardware by about 20%. These lower prices allowed firms to invest more heavily in IT which in turn raised GDP growth by a very large 0.3 percentage points per year since 1995. Prorated on a Canadian scale, this is an accumulated $30 billion injected into the economy. Mann argues that software offshoring is driving the rapid fall in software prices and that this will lead to similar large gains in GDP.

C. *Offshoring and Jobs*

When we talk about jobs, we must be careful to remember that there has been no long-run change in participation rates and unemployment that can be related to international trade.[7] Therefore we are talking about short run displacement and long-run changes in both the level and distribution of wages. The U.S. Bureau of Labor Statistics reports that there were 183,000 mass layoffs in the first quarter of 2004, of which only 4% were due to jobs moving overseas and only 1% were service jobs moving overseas. These are tiny numbers. Workers registering for trade adjustment assistance are also a small group (Baicker and Rehavi, 2004).

[7]Participation rates have been heavily influenced by the entrance of women and the increasingly early retirement of men.

Some argue that these small numbers disguise large sectoral hits. Bardhan and Kroll (2003) note that between 2001 and 2003, employment in the IT service sector fell by about 15%. By implication, outsourcing is hurting the industry. Mann (2003) counters that these large layoffs are primarily due to the collapse of the tech bubble and have little to do with offshoring.

Guestimates of job losses produced by management consultants and industry associations point to larger employment hits in the pipeline. Several of these are cited in Bhagwati et al. (2004) and Brainard and Litan (2004). NASSCOM estimates that 350,000 Indian software jobs currently involve outsourcing to the United States. Goldman Sachs estimates that offshoring has accounted for roughly half a million U.S. layoffs in the past three years. Forrester Research offers one of the largest guestimates: 400,000 jobs were outsourced in 2004 and the number of new outsourced jobs will average 250,000 a year for the next ten years.[8]

Authors such as Kletzer and Litan (2001) and Baily and Farrell (2004) claim that all of these guestimates report such small numbers that the affected workers can easily be absorbed by the U.S. economy. The argument is that since workers eventually find a job, these are job transitions rather than lost jobs. Further, the United States has slightly over 1 million job transitions a year. Hence the offshore-induced job transitions are small relative to the huge job churning in the U.S. economy. This highlights the fact that the outsourcing threat must be measured relative to the capacity of the affected economy (Canada) to help workers make the transition between jobs.

D. *Inshoring and Jobs*

Against these small job loses, must be weighed the fact that Canada inshores billions in services. This implies that we are creating high-paid Canadian jobs for workers who provide services to foreigners. Hanson et al. (2003) and Slaughter (2004) provide important evidence on the jobs created by inshoring. They examine the universe of U.S. multinationals with a parent office in the United States and affiliate offices abroad. Their key finding is that affiliate-office employment does *not* substitute for parent-office employment. A rise in affiliate-office employment does not lead to a fall in parent-office employment.

The explanation for this finding is not complicated. The presumption is that service exports by India necessarily mean lost jobs in Canada. However, there are two reasons

[8] I am very suspicious of the Forrester numbers. Everyone cites them, but few have seen the actual paper and even fewer know what methodology was used. Good advertisement for Forrester, but bad economics for Canada? More generally, all of the guestimates above lack sophisticated analyses. For example, they miss that fact that offshoring may replace capital rather than labour. To see this, ask yourself when the last time was that you spoke to a Bell operator. Likewise, if banks kept their cheque-clearing activities in Canada, they would automate them.

why Canadian employment may not fall. First, certain services are too expensive to be provided in Canada so that the choice is between an Indian service provider or no service at all. Second, offshoring has allowed certain segments of the market to thrive. Thus, the recent re-awakening of the U.S. consumer electronics industry would not have been possible if all the elements of the value chain had to be done in the United States.[9]

E. *Offshoring and Wages*

So far I have discussed employment. Wages also matter. Interviews with businessmen in the IT sector suggest that IT wages have been coming down. It started first in the financial sector a decade ago when $200,000-a-year contract jobs started becoming $125,000-a-year jobs. It continues for programmers – they have seen a steady decline in wages. Surprisingly, Indian programmer wages have been *rising* steadily. The industry is expecting an 15% rise this year alone. These facts have two implications.

For one, rising Indian wages suggest that Indian offshoring in the future may not be as attractive as it is today. In a similar vein, it is interesting to note that real estate prices in Bangalore have also been rising rapidly as contact centres expand.

The fall in Canadian IT wages has a much more important implication. It means that Canadian labour markets have been adjusting to outsourcing via wages rather than employment. This is very unusual: in studies of the impact of international trade, employment typically adjusts more than wages. See Gaston and Trefler (1994) for a survey. There is a very significant silver lining to falling wages. Wage adjustment in place of employment adjustment means that the IT segment of the Canadian labour market has the flexibility needed to handle the offshoring shock. Given the choice, we would all prefer to see falling IT wages rather than falling IT employment.

F. *The Net Effects of Offshoring*

Calculating the current net benefits or losses from offshoring is not easy. Jobs have been both created and destroyed. Farrell (2004) uses data from McKinsey clients to offer a rough approach to estimating net effects. She notes that McKinsey's U.S. clients save about $0.58 for each $1 of corporate spending moved to India. Likewise, McKinsey's German clients save about $0.48 for each $1 of corporate spending moved to India. Farrell argues that the key to estimating the net benefits of offshoring is whether the $1 reduction in domestic wages is lost to the economy or is regained by workers who find new jobs. Using studies

[9]Wood (1994) makes an important counter-argument. If all of the low-wage jobs were kept in Canada, there would be a demand for unskilled labour. This would drive up the wage of high school dropouts, increase the supply of high school dropouts, and make it possible for Canadian firms to supply low-end services using Canadian labour. My own view is that this is good for high school dropouts, but bad for Canada as a whole.

of worker displacement by Kletzer (2001), Farrell argues that U.S. workers regain $0.45 in wages. As a result, the U.S. economy gains $0.03 for every $1 offshored. ($0.03 = $0.58 + $0.45 – $1.00.) In contrast, German workers regain only $0.29 in wages. Thus, the German economy loses $0.20 for every $1 offshored. (–$0.20 = $0.48 + $0.29 – $1.00.)[10]

The Farrell approach is interesting, but is not careful enough about the numbers used for wages regained by U.S. and German workers. Farrell's calculation has two components, the probability of finding a new job and the wage in the new job. On the one hand, Farrell's probability of reemployment is almost certainly too low, thus biasing down her estimates of the benefits. The reemployment probability she uses is for all workers – including unskilled garment workers etc. who are not all that re-employable. In contrast, skilled IT professionals are probably far more motivated to retrain and relocate. This biases down her benefits calculation. On the other hand, Farrell's average wage in the new job is far too high, thus imparting an upward bias to her net benefits calculation. The new-wage calculation she uses (a worker will receive 96% of what he did in his last job) is inconsistent with a number of job displacement studies which find wage losses in the range of 10-25%, depending on the time horizon used e.g., Jacobson, LaLonde and Sullivan (1993) and Liu and Trefler (2005). Further, the rapidly falling wages in the IT sector suggest that displaced IT workers take a larger wage hit than other displaced workers. Thus, Farrell's wage numbers impart an upward bias to her net benefits calculation.

Farrell's calculation suggests that offshoring has been neither a major hit nor a major gain to the Canadian economy. However, there is great uncertainty about her calculation and more work needs to be done.

G. *What's New About Offshoring ... White Collar Workers?*

What is most novel about the impact of service offshoring is that it affects white collar workers employed in technology-intensive industries. We simply do not know what the net effects of this are because empirical trade economists have virtually no experience with this phenomenon. Three issues need to be researched.

1. Many (though not all) white collar jobs are high paying jobs e.g., $70,000 a year. As a country, we are familiar with losing high paying jobs to the United States e.g., head office service jobs and banking service jobs. What we are less familiar with is losing high paying jobs to India. We certainly want to avoid losing these good jobs. However, these losses are somewhat offset by the jobs created for Canadians business analysts with IT expertise. These Canadians work as high-paid intermediaries that interface between Canadian companies and Indian business service providers.

[10]Farrell adds a number of other benefits to the balance sheet, but does include potentially offsetting costs. I therefore ignores these other benefits.

2. When a white collar job is offshored, the value of a Canadian worker's industry-specific and firm-specific knowledge is destroyed. This stands in contrast to what happens when an unskilled worker is displaced. There is little valuable knowledge to be destroyed.

3. There is now a large literature showing that re-training programs are not effective for most displaced workers e.g., Baicker and Rehavi (2004). The argument is that unskilled workers are unskilled for a reason: they are missing the most fundamental of abilities, namely the ability learn. See Heckman and Carneiro (2003) and Trefler (2004b). This means that displaced unskilled workers need income transfers to handle trade shocks. In contrast, IT professionals are likely to be highly motivated individuals who would do well in retraining programs.

H. *Directions for Future Research*

(1) Studies are needed of the effect of service offshoring on the duration of displacement, on whether a job is found in the same industry or occupation, on whether the job is permanent or temporary, on what the new wage is and on whether there are wage gaps appearing between permanent and temporary works. (2) Also needed are studies of the effect of retraining on trade-displaced workers, with special attention to white collar workers. (3) We need to study why wages rather than employment is adjusting and what can be done to ensure that this continues in the future. (4) It would also be good to see if offshoring has shifted the share of Canadian income that is going to labour rather than capital. See, for example, figure 2 in Brainard and Litan (2004). (5) Finally, more work is need along the lines of Morissette and Johnson (2005) who provide little evidence for the argument that offshoring has destroyed good Canadian jobs.

7. Policy Challenges

By any international yardstick Canada is a rich and successful economy. However, it could do better and if it does not actively work on doing better, we will find ourselves falling behind. The problem is that offshoring has raised the stakes in the global competition game. *The primary effect of offshoring is that it makes it all the more important for Canada to adopt productivity-enhancing domestic policies.* What follows is a list of the key policy issues. I start with what we should not do. It is perhaps worth focusing on two policies, one which receives too much attention and one which receives too little attention.

A. *Dumb Ideas*

It is very tempting to approach the problem of how to benefit from offshoring as a problem of designing an industrial policy that successfully picks winners. This is a dumb idea. We should not be in the business of subsidizing contact centres, management consultants, financial institutions, or insurance companies. Another dumb idea is to adopt a protectionist stance. This will help in the short run, but it will provide the wrong long-run incentives for investing in productivity. I will explain why in detail below.

B. *The Destruction of Human Capital*

The new competition from offshoring will lead to lost jobs and bankruptcies. Each time a worker is separated from her firm, firm-specific human capital is lost. This reduces the incentives of both managers and workers alike to invest in developing firm-specific knowledge. For example, a high-paid IT consultant will typically know much more than just IT. She will know about the unique needs of her firm. Offshoring leads to more frequent separations between workers and firms, thus destroying important dimensions of Canadian human capital.

There is solid evidence to support concerns about the destruction of human capital. Wasmer (2002) demonstrates that the major differences between European and U.S. labour markets stems from differences in the specificity of human capital investments. Martin and Moldoveanu (2003) offers substantial evidence on the rising importance of human capital for firm value. For example, in 2000, Cisco Systems employees earned between $5 and $8 billion in option profits alone at a time when the company only made $4.6 billion. Ensuring that firm-relevant human capital continues to be created in Canada is a key policy concern.

The policy issues that flow from this are not well understood. There is a tension between promoting long-term relationships and promoting flexibility. Flexibility describes how easy it is both for workers and for firms to terminate a relationship and find an alternative one. How do we design incentives for greater on-the-job training and formal job training programs in an environment where offshoring is likely to reduce the length and value of worker-firm relationships? How do we help workers carry accumulated skills across firms? Should corporate and personal taxes reflect our need to promote both greater specific investments as well as greater flexibility? The reason why there is a role for government is the existence of a contractual incompleteness: after relationship-specific training has occurred, workers cannot credibly commit to staying with the firm.

C. *Policy Conclusions*

Most of the sensible policies aimed at fostering Canadian competitiveness in the service offshoring market are investment-promoting framework policies. They encourage Canadian workers, firms, and governments to invest in building productive assets such as human capital and new technologies. Such framework policies address a whole host of domestic competitiveness issues and so are not unique to issues raised by service offshoring. Nevertheless, it would be a mistake to think that this makes framework policies less central to issues raised by service offshoring.

Offshoring creates only a few new policy issues. First, it forces Canadian firms to be part of a global market and hence to compete globally. It thus makes framework policies that encourage investment and competitiveness all the more important. Second, it creates more churning among firms and workers, thus destroying human capital that is specific to worker-firm matches. We must think of policies that encourage these investments without at the same time creating the kinds of labour market inflexibilities that are the source of Euro-sclerosis. Third, it may be important politically to find ways of helping workers displaced by service offshoring.

References

Accenture, "Driving High-Performance Outsourcing: Best Practices from the Masters, Executive Survey Results," Technical Report 2004.

Antràs, Pol, "Firms, Contracts, and Trade Structure," *Quarterly Journal of Economics*, November 2003, *118* (4), 1375–1418.

_ , "Incomplete Contracts and the Product Cycle," *American Economic Review*, 2005, *Forthcoming*.

_ **and Elhanan Helpman**, "Global Sourcing," *Journal of Political Economy*, 2004, *112*, 552–580.

Arora, Ashish and Alfonso Gambardella, "The Globalization of the Software Industry: Perspectives and Opportunities for Developed and Developing Countries," *Innovation Policy and the Economy*, 2005, *5*, 1–32.

Audretsch, David B. and Maryann P. Feldman, "Knowledge Spillovers and The Geography of Innovation and Production," *American Economic Review*, June 1996, *86* (3), 630–640.

Baicker, Katherine and M. Marit Rehavi, "Policy Watch: Trade Adjustment Assistance," *Journal of Economic Perspectives*, Spring 2004, *18* (2), 239–255.

Baily, Martin N. and Diana Farrell, "Exploding the Myths about Offshoring," Technical Report, McKinsey Global Institute, April 2004.

Baldwin, John and Wulong Gu, "Participation in Export Markets and Productivity performance in Canadian Manufacturing," *Canadian Journal of Economics*, 2003, *36* (3), 634–657.

_ **and** _ , "The Impact of Trade on Plant Scale, Production-Run Length and Diversification," Working Paper, Statistics Canada, July 2004.

_ **and** _ , "Trade Liberalization: Export-Market Participation, Productivity Growth and Innovation," *Oxford Review of Economic Policy*, 2005.

_ , **Richard E. Caves, and Wulong Gu**, "Responses to Trade Liberalization: Changes in Product Diversification in Foreign and Domestic Controlled Plants," in L. Eden and W. Dobson, eds., *Governance, Multinationals and Growth*, Edward Elgar Publishing, 2004.

Bardhan, Ashok D. and Cynthia Kroll, "The New Wave of Outsourcing," Working Paper No. 1103, Fisher Center for Real Estate and Urban Economics, 2003.

Bartel, Ann, Saul Lach, and Nachum Sicherman, "Outsourcing and Technological Change," Working Paper No. 11158, National Bureau of Economic Research, 2005.

Bhagwati, Jhagdish, Arvind Panagariya, and T.N. Srinivisan, "The Muddles over Outsourcing," *Journal of Economic Perspectives*, Fall 2004, *18* (4), 93–114.

Brainard, Lael and Robert E. Litan, ""Offshoring "Service Jobs: Bane or Boon – and What to Do?," *The Brookings Institution Policy Brief*, April 2004, *132*, 520–540.

Clissold, Tim, *Mr. China*, London: Constable and Robinson Ltd., 2004.

Coase, Ronald, "Nature of the Firm," *Economica*, November 1937, *4* (4), 386–405.

Farrell, Diana, "Can Germany Win from Offshoring?," Technical Report, McKinsey Global Institute, July 2004.

Gaston, Noel and Daniel Trefler, "The Role of International Trade and Trade Policy in the Labour Markets of Canada and the United States," *World Economy*, January 1994, pp. 45–62.

Ginarte, Juan Carlos and Walter Park, "Determinants of Patent Rights: A Cross-National Study," *Research Policy*, October 1997, *26* (3), 283–301.

Gomory, Ralph E. and William J. Baumol, *Global Trade and Conflicting National Interests*, Cambridge, Mass.: MIT Press, 2000.

Graham, Frank D., "Some Aspects of Protection Further Considered," *Quarterly Journal of Economics*, February 1923, *37* (2), 199–227.

Grossman, Gene and Elhanan Helpman, "Intergration versus Outsourcing in Industry Equilibrium," *Quarterly Journal Economics*, 2002, *117*, 85–120.

_ **and** _ , "Outsourcing versus FDI in Industry Equilibrium," *Journal of the European Economic Association*, 2003, *1*, 317–327.

_ **and** _ , "Outsourcing in a Global Economy," *Review of Economic Studies*, 2005, *72*, 135–159.

Grossman, Sanford J. and Oliver D. Hart, "Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration," *Journal of Political Economy*, August 1986, *94* (4), 691–719.

Gwartney, James and Robert Lawson, *Economic Freedom of the World: 2003 Annual Report*, Vancouver: The Fraser Institute, 2003.

Hanson, Gordon H., Raymond J. Mataloni, and Matthew J. Slaughter, "Vertical Production Networks in Multinational Firms," Working Paper No. 9723, National Bureau of Economic Research, 2003.

Heckman, James and Pedro Carneiro, "Human Capital Policy," Working Paper No. 9495, National Bureau of Economic Research, February 2003.

Hejazi, Walid and Daniel Trefler, "Canada and the Asia Pacific: Views from the Gravity, Monopolistic Competition, and Heckscher-Ohlin Models," in Richard G. Harris, ed., *The Asia-Pacific Region in the Global Economic: A Canadian Perspective*, Calgary: University of Calgary, 1996, pp. 47–83.

Helpman, Elhanan, *The Mystery of Economic Growth*, Cambridge, MA: Harvard, 2004.

Hicks, John R., "An Inaugural Lecture," *Oxford Economic Papers*, June 1953, *5* (2), 117–135.

Jacobson, Louis S., Robert J. LaLonde, and Daniel G. Sullivan, "Earnings Losses of Displaced Workers," *American Economic Review*, September 1993, *83* (4), 685–709.

Jaffe, Adam B., Manuel Trajtenberg, and Rebecca Henderson, "Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations," *Quarterly Journal of Economics*, August 1993, *108* (3), 577–598.

Johnson, George E. and Frank P. Stafford, "International Competition and Real Wages," *American Economic Review*, August 1993, *82*, 127–130.

Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobaton, "Governance Matters," Policy Research Working Paper No. 2196, World Bank 1999.

Klein, Benjamin, Robert G. Crawford, and Armen A. Alchian, "Vertical integration, appropriable rents, and the competitive contracting process," *Journal of Law and Economics*, 1978, *21* (2), 297–326.

Kletzer, Lori, *Job Loss from Imports: Measuring the Costs*, Washington, D.C.: Institute for International Economics, 2001.

Kletzer, Lori G. and Robert E. Litan, "A Prescription to Relieve Worker Anxiety," *Institute for International Economics Policy Brief*, February 2001, *01* (2).

Lileeva, Alla, "Import Competition and Selection," Working Paper, York University, 2004.

Liu, Runjuan and Daniel Trefler, "Low-Wage Import Competition and Worker Displacement," 2005. Mimeo, University of Toronto.

Mann, Catherine, "Globalization of IT Services and White Collar Jobs," Policy Brief PBO 3–11, Institute for International Economics December 2003.

Markusen, James R., "Contracts, Intellectual Property Rights, and Multinational Investment in Developing Countries," *Journal of International Economics*, 2001, *53* (1), 189–204.

Martin, Roger and Mihnea C. Moldoveanu, "Capital Versus Talent: The Battle That's Reshaping Business," *Harvard Business Review*, July 2003.

Mokyr, Joel, *The Lever of Riches: Technological Creativity and Economic Progress*, New York: Oxford University Press, 1990.

Morissette, Rene and Anick Johnson, "Are Good Jobs Disappearing in Canada," *Economic Policy Review of the Federal Reserve Bank of New York*, 2005.

Nunn, Nathan, "Relationship-Specificity, Incomplete Contracts, and the Pattern of Trade," 2005. Mimeo, University of Toronto.

Porter, Michael E., "The Competitive Advantage of Nations," in Michael E. Porter, ed., *On Competition*, Cambridge, MA: HBS Press, 1998, pp. 155–195.

Rosenberg, Nathan, "Universities as Economic Institutions," Technical Report, Canadian Institute for Advanced Research, October 1997.

_ **and L.E. Birdzell**, *How the West Grew Rich: The Economic Transformation of the Industrial World*, New York: Basic Books, 1986.

Rothschild, Michael, "What Makes American Public Universities Great?," *NBER Reporter*, Winter 2003.

Samuelson, Paul A., "Where Ricardo and Mill Rebut and Confirm Arguments of Mainstream Economists Supporting Globalization," *Journal of Economic Perspectives*, May 2004, *18* (3), 135–146.

Slaughter, Matthew J., "Insourcing Jobs: Making the Global Economy Work for America," Working Paper, Tuck School of Business, 2004.

Stalk, George and Thomas Hout, *Competing against Time: How Time-Based Competition is Reshaping Global Markets*, New York, NY: Free Press, 1990.

Trefler, Daniel, "The Long and Short of the Canada-U.S. Free Trade Agreement," *American Economic Review*, 2004.

_ , "Looking Backwards: How Childhood Experiences Impact a Nations's Wealth," February 2004. Mimeo, University of Toronto.

UNCTAD, *World Investment Report*, Geneva: United Nations, 2004.

Wasmer, Etienne, "Intepreting Europe and US Labor Market Differences: The Specificity of Human Capital Investments," Discussion Paper No. 549, IZA, August 2002.

Williamson, Oliver E., *Markets and Hierarchies: Analysis and Antitrust Implications*, New York: Free Press, 1975.

_ , *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*, New York: Free Press, 1985.

Wood, Adrian, *North-South Trade, Employment and Inequality: Changing Fortunes in a Skilled-Driven World*, Oxford: Clarendon Press, 1994.